

specimens in the uncertain range than in the bath specimens. This was most likely due to the severity of the bath environment, as compared with the chamber. Unlike the baths, there is no real cyclic trend observed because readings were taken in the chamber under similar saturation conditions each week.

While a number of trends were observed with the half cell data, there is no clear indication as to which corrosion inhibitor products performed the best. This is primarily due to the nature of this data. The data provides the probability that corrosion is or is not occurring, but it does not provide to what extent the corrosion occurs. For example, two specimens may have very different potentials both more negative than -0.35 V and therefore both have a 90% probability that corrosion is occurring. The standard does not state that the more negative, the more probable corrosion, but rather gives only the limits listed above. This leads to the conclusion that no comparison may be directly drawn between the performances of different corrosion inhibitors based solely on the half cell potential data. The half cell potential data can be used to determine the probability of corrosion only.

It is important to note that there are many factors that affect the accuracy of half cell potential readings, including temperature, light, and cleanliness of the electrode (Ansuini & Dimond 1994). These factors, along with the precision of the half cell readings make it impractical to determine the performance of the corrosion inhibitor products from this measurement alone. The full set of graphs of half cell potentials over time for all specimens can be seen in Appendix C.

4.2.3 Environmental Readings and Results

The environmental readings taken during this testing program included salt-water concentration, pH, temperature, and humidity. These readings, similar to the voltmeter and half cell readings, were taken on a weekly basis. The details for collecting the environmental data were described in Section 3.6.3. Figure 4.10 shows the change in salinity over time for the baths and the chamber.

Although slight changes in salinity occur periodically, it is evident that the average remains relatively close to the target 15% NaCl concentration. Furthermore, adjustments were made every time a change was observed.

The target pH for the water used in this project was a neutral range from 6-8. Figure 4.11 shows the change in pH over time for the baths and the chamber.